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(58) Field of search

G4N

## (54) Display apparatus

(57) A video display 1 for advertising in a shop has an ultrasonic transmitter 2 which broadcasts continuously a signal of 27K Hz throughout the customer area 3 of the shop. Adjacent to transmitter 2 there is located an ultrasonic receiver 4 directed towards area 3 thereby to receive any ultrasonic waves reflected off objects in the area. Any moving object generates a change in the ultrasonic waves reaching receiver 4; when a comparator monitor 6 notes such a change, a video tape recorder 10 is activated in order to play back, on television receiver 5, a video tape of an advertisement.

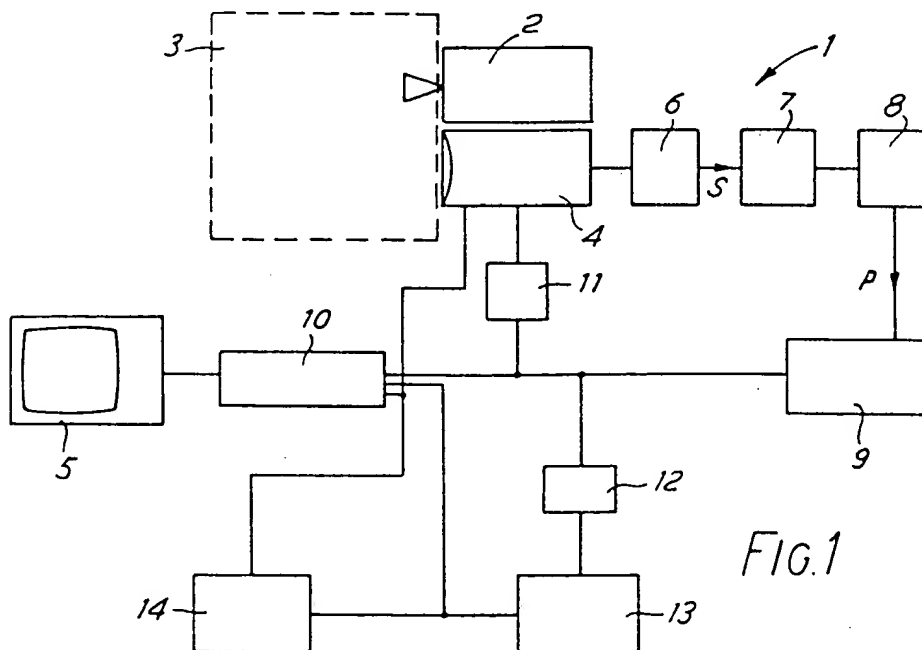
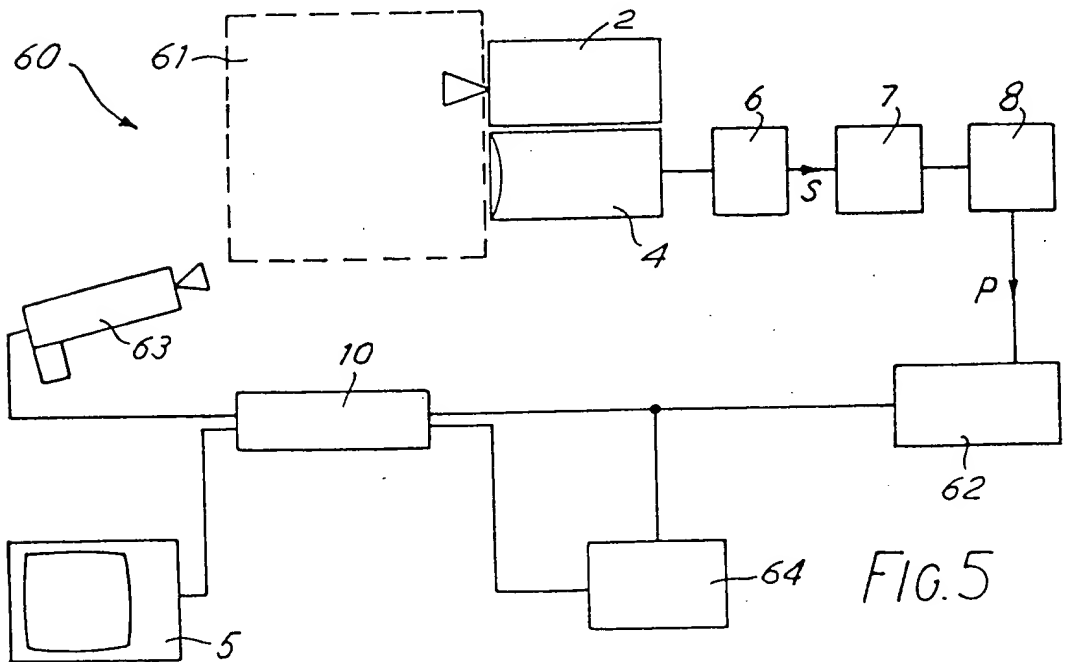
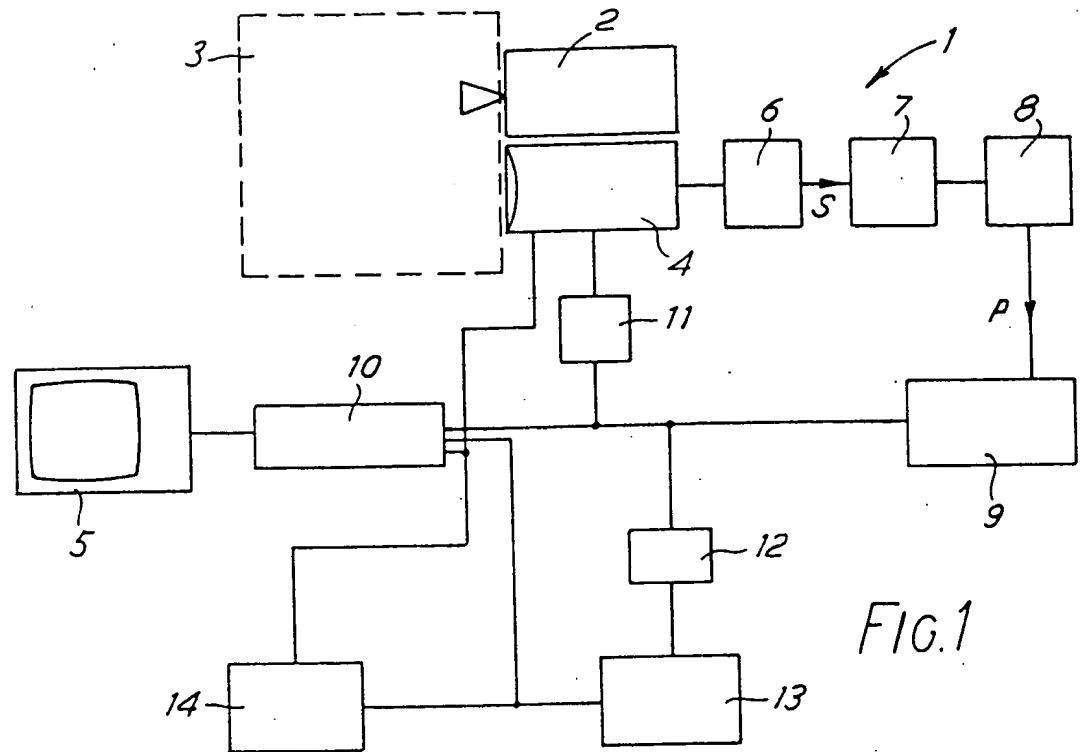


FIG. 1



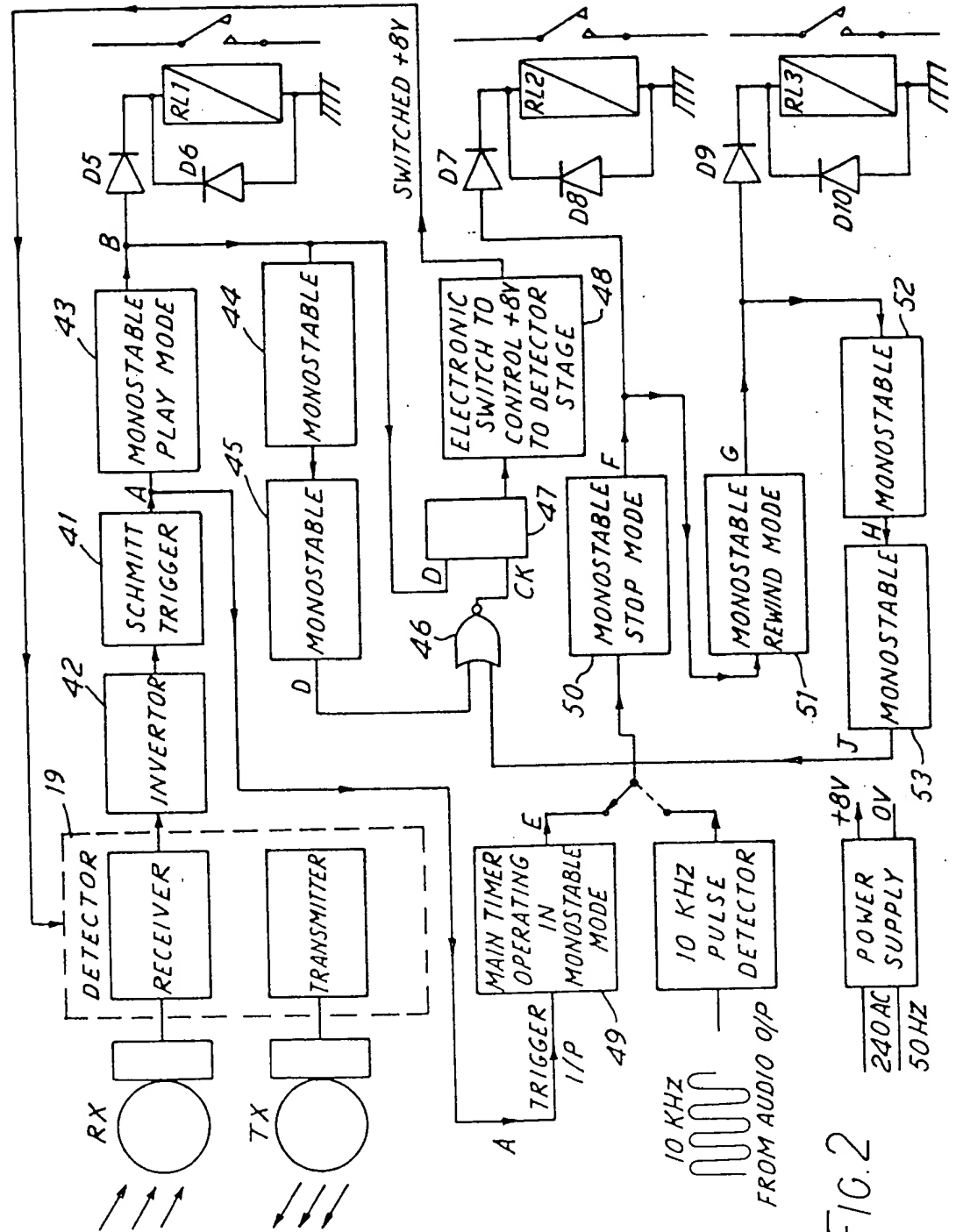


FIG. 2

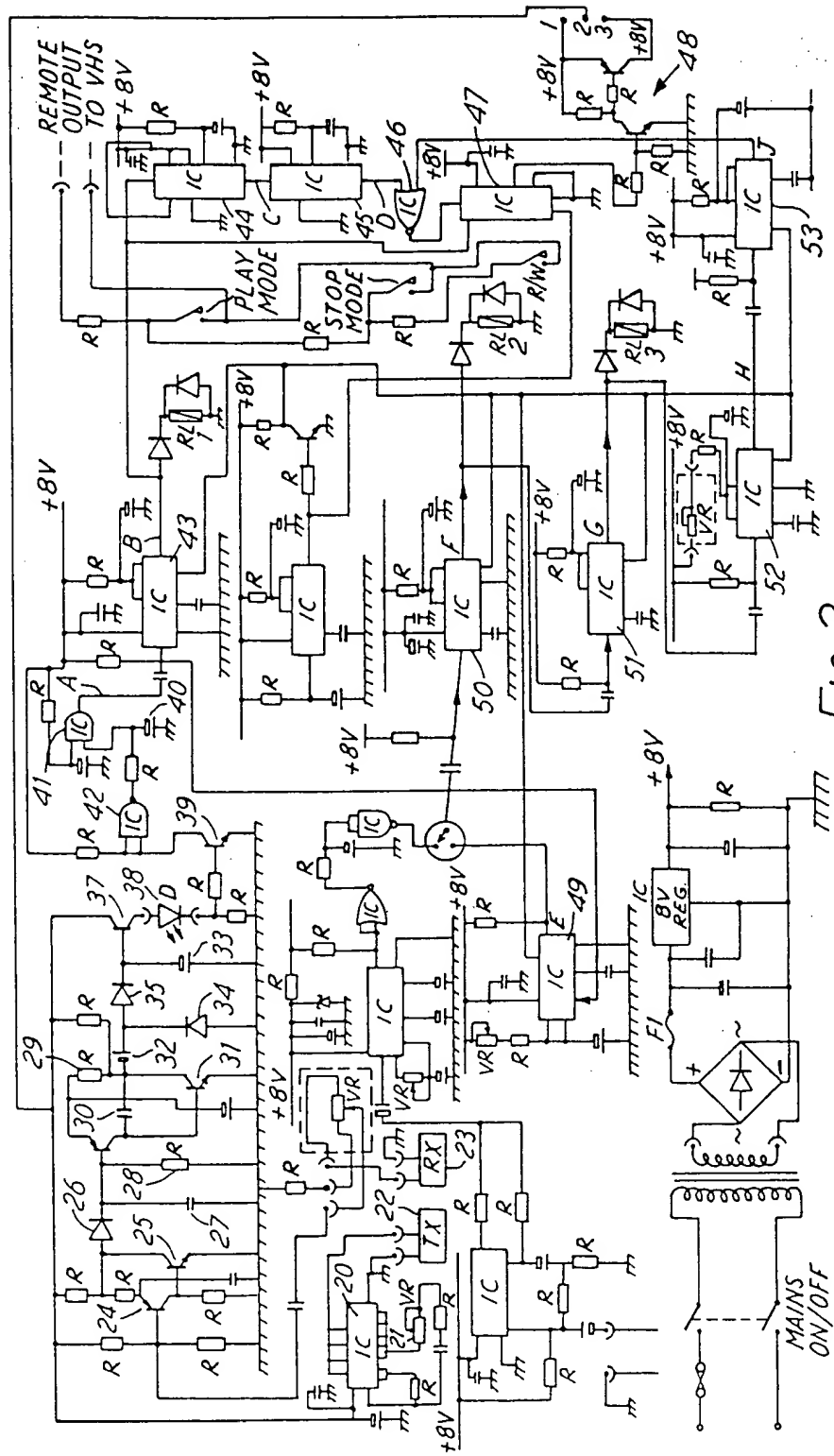


FIG. 3

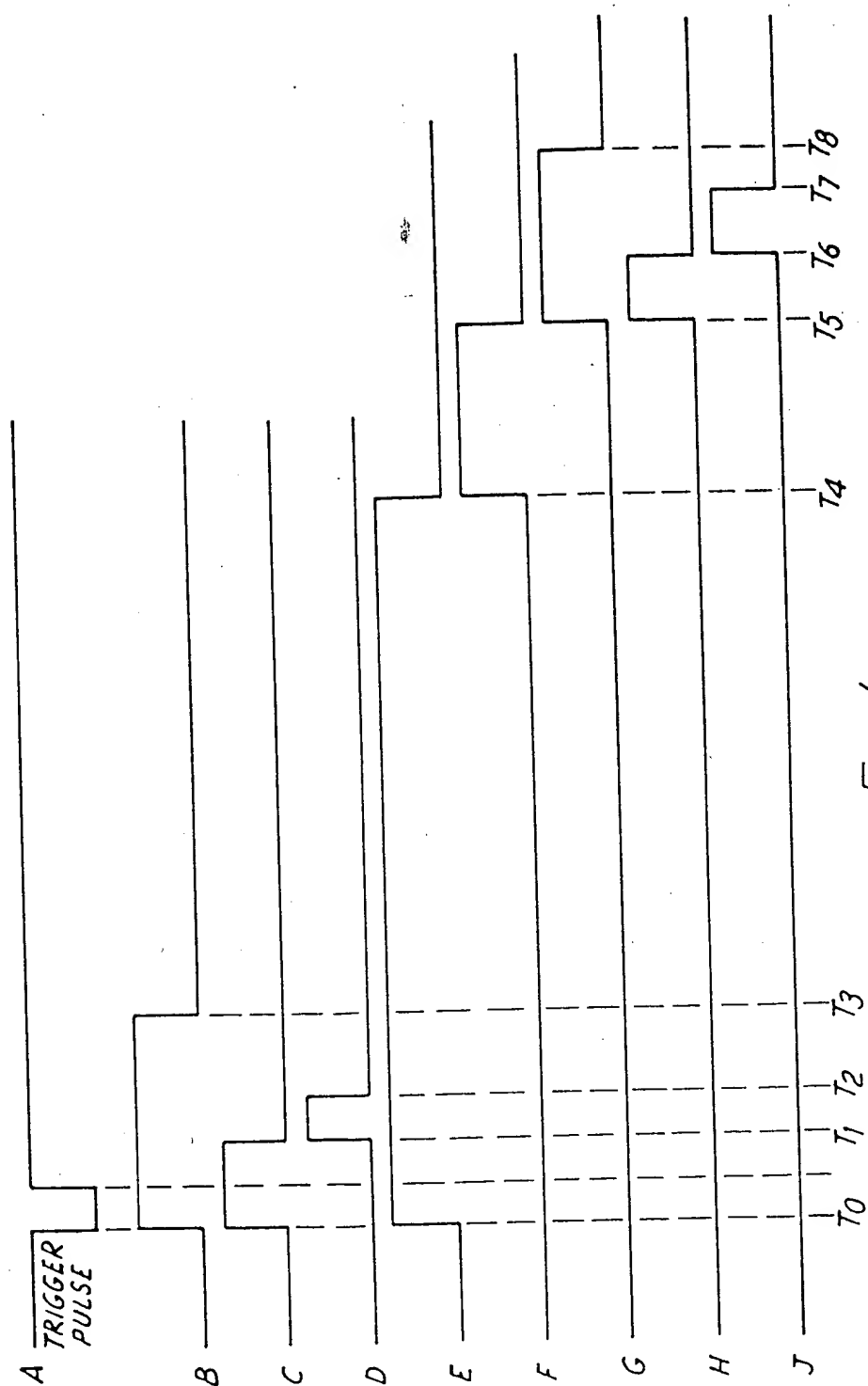


FIG. 4

## SPECIFICATION

### Display apparatus

5 The present invention relates to display apparatus incorporating a television receiver.

10 In the invention, the presence of a moving person or object is used to operate the video tape recorder or disc player in a predetermined manner.

Thus, the present invention provides display apparatus comprising means to produce a video recording, the video reproducing means being electrically connected to a television receiver, means to detect the presence of a person or object moving in a predetermined region and means to activate, when the detector means indicates such presence, operation of the reproducing means.

20 In one form of the invention, the activation means operates, in use, the video reproducing means such as to play back a pre-recorded tape or disc for display on the television receiver which is positioned such that it can be readily seen from the predetermined region. Thus this form of the display apparatus is suited to situations (for example in a shop or at an exhibition) in which it is desirable to attract the attention of a person whose presence is detected by the detection means.

30 In any form of the invention, the display apparatus may include means to terminate the operation of the video reproducing means in accordance with the detector means indicating the absence of movement in the predetermined zone; the termination means may act on the video reproducing means as soon as no movement is detected, or it may act only after a given time has elapsed since movement was last detected. In another form of the invention, the display apparatus includes means to terminate operation of the video reproducing means after a given time period has elapsed since the initial detection of movement in the region; in this case, operation of the video reproducing means is stopped regardless of whether there is still movement in the region.

Any form of the termination means described above may also initiate a further operation of the video reproducing means, for example the resetting of the video reproducing means to a mode in which it is ready for activation if further movement is detected.

55 In any form of the invention, preferably the activation means operates the video reproducing means only if the detector means has detected movement for a given time period continuously within the region.

60 Preferably the detector means comprises an ultrasonic transmitter which, in use, sends out continuously a given signal to the region, and an ultrasonic receiver which detects any change to the received signal caused by movement of persons or of objects within that

region.

70 The video reproducing means may be any suitable form of video tape recorded or video disc recorder, and the television receiver may be a television monitor and may incorporate any suitable form of display, e.g. cathode ray tube or solid state display.

In order that the invention may more readily be understood, a description is now given by way of example, only, reference being made to the accompanying drawings, in which:—

75 *Figure 1* is a block diagram of display apparatus embodying the present invention;

80 *Figure 2* is a block diagram of display apparatus generally similar to that shown in *Fig. 1*;

*Figure 3* is a circuit diagram of control equipment for the display apparatus of *Fig. 2*;

85 *Figure 4* is a diagram of the timing waveforms for the equipment of *Fig. 2*; and

*Figure 5* is a block diagram of another form of display apparatus.

The block diagram of *Fig. 1* shows the elements in a video display 1 for use in a shop. The video display equipment 1 has an ultrasonic transmitter 2 which broadcasts continuously a signal of 27 kHz throughout the customer area 3 of the shop. Adjacent to transmitter 2, there is located an ultrasonic receiver 4 directed towards area 3 thereby to receive ultrasonic waves which bounce off any objects in the area. A television receiver 5 is positioned for easy viewing from customer area 3. At this stage no image is being displayed on television receiver 5; the only elements of the equipment 1 in active operation are transmitter 2 and receiver 3, the remainder being in a "standby" mode.

When movement occurs in customer area 2, the ultrasonic signal received at receiver 3 changes in amplitude or in frequency or in both; a comparator monitor 6 notes this change and generates an appropriate signal S which is subsequently amplified by amplifier 7 and then passed on to a timer 8. If the signal S exceeds two seconds in duration, a pulse signal P is passed on to "play-mode" operator 9 which activates a video tape recorder 10 to play back a pre-recorded video tape of an advertisement on the television receiver 5. Thus, within three seconds of a person entering the customer area 2, the television receiver is displaying the start of an advertisement for him or her to watch.

120 The signal sent out from "play-mode" operator 9 is also passed firstly to a receiver-disabling unit 11 which turns off the ultrasonic receiver 4 and secondly to a timer 12 which is set to count over a period corresponding to the time interval for playing back the advertisement. Thus, once this time interval has elapsed, timer 12 enables a "stop-mode" operator 13 which sends a control pulse to video tape recorder 10 to terminate playback of the video tape. This control pulse also

are "on heat").

- In one monitor system, a video tape recorder and associated video camera are controlled to turn on automatically at predetermined intervals and remain on for a specified time. The system may be used such that, when so activated, a video recording is made of the area and/or such that the image from the video camera is displayed at a remote monitoring station (e.g. the guardhouse). In one form, the system is activated solely according to this dependent operation. In another form, the time-dependent operation is added to the monitor system described with reference to Fig. 5; thus a recording is made regularly even if no movement is detected in the zone being monitored.

#### CLAIMS

1. Display apparatus comprising means to reproduce a video recording, the video reproducing means being electrically connected to a television receiver, means to detect the presence of a person or object when moving in a predetermined region and means to activate, when the detector means indicates such presence, operation of the video reproducing means.
2. Display apparatus according to Claim 1, wherein the activation means operates, in use, the video reproducing means such as to play back a pre-recorded tape or disc for display on the television receiver which is positioned such that it can be readily seen from the predetermined region.
3. Display apparatus according to Claim 1 or Claim 2, wherein the detector means comprises an ultrasonic transmitter which, in use, sends out continuously a given signal to the region, and an ultrasonic receiver which detects any change to the received signal caused by movement of persons or of objects within that region.
4. Display apparatus according to Claim 3, wherein the detector means comprises means to identify a Doppler-shift in the received signal.
5. Display apparatus substantially as hereinbefore described with reference to and as illustrated in Fig. 1 or in Figs. 2, 3 and 4 of the accompanying drawings.